

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 January 2005 (13.01.2005)

PCT

(10) International Publication Number
WO 2005/004202 A2

(51) International Patent Classification⁷:

H01L

(74) Agents: McCOLLISTER, Scott, A. et al.; Fay, Sharpe, Fagan, Minnich & McKee, LLP, 1100 Superior Avenue, 7th floor, Cleveland, OH 44114 (US).

(21) International Application Number:

PCT/US2004/020086

(22) International Filing Date: 23 June 2004 (23.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/480,975 24 June 2003 (24.06.2003) US
60/545,445 17 February 2004 (17.02.2004) US

(71) Applicant (for all designated States except US): GEL-CORE LLC [US/US]; 6180 Halle Drive, Valley View, OH 44125-4635 (US).

(72) Inventors; and

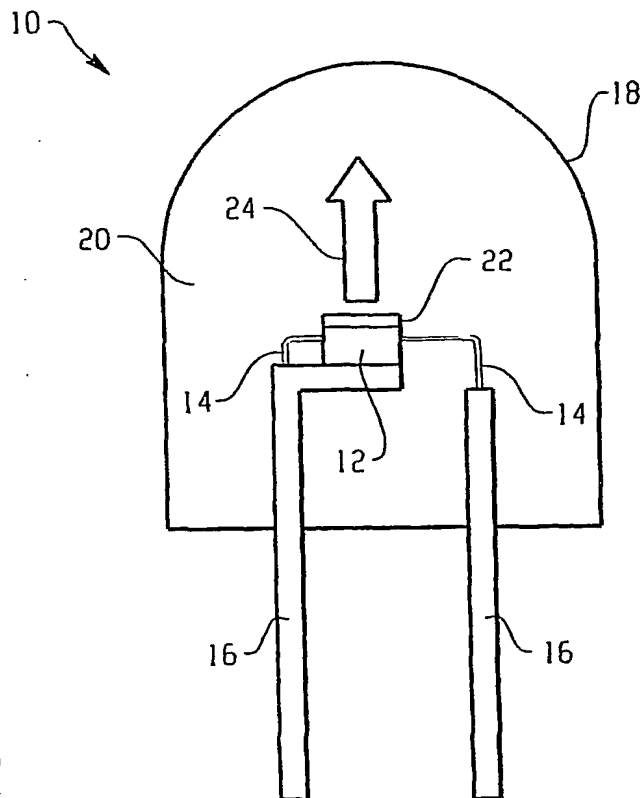
(75) Inventors/Applicants (for US only): RADKOV, Emil [BG/US]; 26241 Lakeshore Boulevard, Apt. 670, Euclid, OH 44132 (US). SETLUR, Anant, A. [US/US]; 2081 Orchard Park, Niskayuna, NY 12309 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,

[Continued on next page]

(54) Title: FULL SPECTRUM PHOSPHOR BLENDS FOR WHITE LIGHT GENERATION WITH LED CHIPS



(57) Abstract: A light emitting device including a phosphor blend including four or more phosphors emitting within a specific spectral range to optimize the color rendering index (CRI) for a given color coordinated temperature (CCT). The blend will include at least four phosphors selected from the following: a blue phosphor having an emission peak at 400-500 nm, a green phosphor having an emission peak at 500-575 nm, an orange phosphor having an emission peak from 575-615 nm, and a deep red phosphor having an emission peak at 615-680 nm. The preferred blends are used to make light sources with general CRI values (R_a) greater than 95 at CCT's from about 2500 to 8000 K.

WO 2005/004202 A2



SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *without international search report and to be republished upon receipt of that report*